

Analytical Study of Waste Generation and Management: A scenario in Uttar Pradesh

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ABSTRACT: Waste management or waste disposals are all the activities and actions required to manage waste from its inception to its final disposal. This includes amongst other things collection, transport, treatment and disposal of waste together with monitoring and regulation. It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling. Waste can take any form that is solid, liquid, or gas and each have different methods of disposal and, management. Waste management normally deals with all types of waste whether it was created in forms that are industrial biological, household, and special cases where it may pose a threat to human health. It is produced due to human activity such as when factories extract and process raw materials. Waste management is intended to reduce adverse effects of waste on health, the environment or aesthetics. This paper makes an attempt to study about the waste generation and management in a macro aspect.

Keywords- Waste, generation, management.

I. Introduction

The concept of environment has been fairly strongly in ancient civilizations like Indian, Roman, Greek and Chinese. At that time they gave more importance to the environment. But the problem of environmental pollution gained importance only after industrialization. The expanding economic activities and increasing population led to increasing use of natural resources for the satisfaction of bundle requirements. This over exploitation of nature led to the imbalance in the economic system. Economic development is a very important concept today all over the world .To achieve a better living standard, the increasing population draws more resources from the environment. The rising levels of production and consumption result in increasing resources flows and discharge of residues. When these discharge increase, the capacity of environment to successfully assimilate will be reduced and the resulting pollution impairs the supply of natural resources. In this view, indefinitely prolonged economic development may be impossible with the finite nature of resources stocks. The attempt to link development and environmental issue is not simple. Development issues range from macro-international to micro project level and there are differences in view among developed and developing countries in the ranking of environment and developmental problem faced by nations.

One of the challenging problems of the urban environment is related to solid waste. With increasing population and income of the urban residents are also changing. The quality and volume of solid waste is directly related with the affluence of population. The problems of solid waste accelerated with the one set of the industrial revolution in 18th century concomitant with urbanization process.

Waste management or waste disposals are all the activities and actions required to manage waste from its inception to its final disposal. This includes amongst other things collection, transport, treatment and disposal of waste together with monitoring and regulation. It also encompasses the legal and regulatory framework that relates to waste management encompassing guidance on recycling. Waste can take any form that is solid, liquid, or gas and each have different methods of disposal and, management. Waste management normally deals with all types of waste whether it was created in forms that are industrial biological, household, and special cases where it may pose a threat to human health. It is produced due to human activity such as when factories extract and process raw materials. Waste management is intended to reduce adverse effects of waste on health, the environment or aesthetics.

Waste management practices are not uniform among countries (developed and developing nations); regions(urban and rural areas),and sectors (residential and industrial). A large portion of waste management practices deal with Municipal Solid Waste (MSW)which is waste that is created by household, industrial and commercial activity.

Throughout most of history, the amount of waste generated by humans was insignificant due to low population density and how societal levels of the exploitation of natural resources. Common waste produced during pre-modern times was mainly ashes and human biodegradable waste, and these were released back into the ground locally, with minimum environmental impact. Tools made out of wood or metal were generally reused or passed down through the generations. However, some civilizations do seem to have been more profligate in their waste output than others. In particular, the Maya of Central America had a fixed monthly ritual, in which the people of the village would gather together and burn their rubbish in large dumps.

Municipal waste managers are charged with an enormous task get the waste out from underfoot and so in the most economically, socially and environmentally optimal manner possible. Waste management is almost always the responsibility of local governments and is often their single largest budget item, particularly in developing countries. Waste management and street sweeping is also often the city's single largest source of employment. Local waste management officials also need to deal with the integrated and international aspects of waste, and increasingly with demographic change in the work force, employment generation and management of staff-both formal and informal. In the municipal waste stream, waste is broadly, classified into organic and inorganic. In the waste composition is categorized as organic, paper, plastic, glass, and metals and other. Managing municipal waste is an intensive service. Municipalities need capacities in procurement contract management professional and often unionized labour management and ongoing expertise in capital and operating budgeting and finance. Municipal waste also requires a strong social contract between the municipality and community. All of these skills are prerequisites for other municipal services.

Statement of the problem:

Solid waste management is a continually growing problem at global, regional, and local levels. Economic development, globalization and improving living standard in cities have lead to increase in the quantity and complexity of generated waste. Solid waste management is one of the crucial areas indicating the status of urban infrastructure and environment quality. It assumes particular significance in the view of the challenge posed by rapid urbanization and industrialization and also from the point of view of natural resource management; protection of open places and hygiene conditions in general management of waste resulting out of the rapid urbanization had become a serious concern for the government department and local bodies, pollution control agencies, regulatory bodies, and also the public rapid growth of population and industrialization degrade urban environment and place serious stress on natural resources, which undermine equitable and sustainable development .

The present study is an attempt to bring a shed on waste generation and management in India and Uttar Pradesh. Waste management is carried out to reduce the material effect on the environment and to recover resources from them. Waste management involves the responsible sourcing of materials and responsible disposal of any waste.

Objective

1. To explain the waste generaion and management in India and Uttar Pradesh.

Data sources:

The study conducted on the basis of secondary data. Secondary data were collected from various journals and from authentic websites are used for analysis. The collected data were analyzed with appropriate statistical tools like tables, graphs, percentages.

Importance of the study:

Being a consumer state, Uttar Pradesh is depending on the neighbouring states for all its needs. Further, it is fast becoming a world tourist center because of its natural beauty. It is assumed to have a developed modern society with comparatively unique social development indices than other Indian states. The fast-changing life styles of the people in Uttar Pradesh make solid waste composition extremely vulnerable. Though ranked as a top layer State based on many indices, its solid waste efforts are far below the accepted standards. There is an urban-rural continuum with even the rural areas displaying distinct urban characteristics like high population densities and composite primary and tertiary occupation structures (KSIDC). The efforts of the Government for an organized MSWM are not hitting the target because of lack of commitment of people who are in the clutches of the 'NIMBY Syndrome' (Not in My Backyard), carelessly throwing away waste to streets and water bodies. In Uttar Pradesh, household sanitation level is very high but, environmental sanitation level is surprisingly low.

Unplanned disposal of solid waste seriously contaminates the air and fresh-water sources in Municipal Limits. On the other hand, Municipal Authorities do not possess the required expertise and professionalism to tackle the ever-mounting waste issues. A group of Government servants, called 'Health Wing' in each Municipality, is performing solid waste operations without proper training and technical knowledge. The issues

are too big to be handled by them who try to resolve the problems with a weak resource base and technical support.

II. Results and discussion:

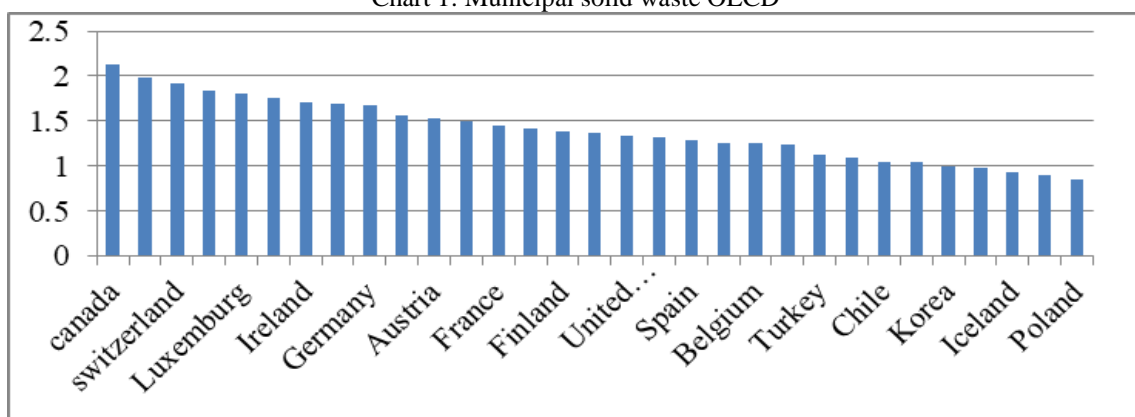
Municipal solid waste (MSW) is the abridgment of the waste generation from domestic, commercial, and construction activities by natural persons that is collected and treated by municipalities. Currently, 1.3 billion metric tons of Municipal solid wastes (MSW) are generated annually in the world, and this amount is expected to rise to about 2.2 billion tons by 2025, although MSW generation in Organisation for Economic and Development (OECD) member countries has been decreasing. MSW generation is influenced by economic conditions, living standards, urbanization and population. Dramatic increase in population in urban areas are typical phenomena in Africa and Asia, and the amount of MSW generated dramatically increase as a consequence. Historical data compilation of MSW generation per capita, a core indicator of environmental pressure.

Table 1 - Municipal solid waste OECD

| No | OECD Member Countries | MSW generation (kg person per day) |
|----|-----------------------|------------------------------------|
| 1 | Canada | 2.13 |
| 2 | United states | 1.99 |
| 3 | Switzerland | 1.91 |
| 4 | Denmark | 1.83 |
| 5 | Luxembourg | 1.80 |
| 6 | Australia | 1.75 |
| 7 | Ireland | 1.70 |
| 8 | Israel | 1.69 |
| 9 | Germany | 1.67 |
| 10 | New Zealand | 1.56 |
| 11 | Austria | 1.53 |
| 12 | Netherland | 1.50 |
| 13 | France | 1.45 |
| 14 | Italy | 1.42 |
| 15 | Finland | 1.39 |
| 16 | Greece | 1.37 |
| 17 | United kingdom | 1.34 |
| 18 | Norway | 1.31 |
| 19 | Spain | 1.28 |
| 20 | Sweden | 1.26 |
| 21 | Belgium | 1.26 |
| 22 | Portugal | 1.23 |
| 23 | Turkey | 1.12 |
| 24 | Hungary | 1.09 |
| 25 | Chile | 1.04 |
| 26 | Mexico | 1.04 |
| 27 | Korea | 0.99 |
| 28 | Slovenia | 0.98 |
| 29 | Iceland | 0.93 |
| 30 | Japan | 0.90 |
| 31 | Poland | 0.85 |

Source: Municipal solid Waste OECD

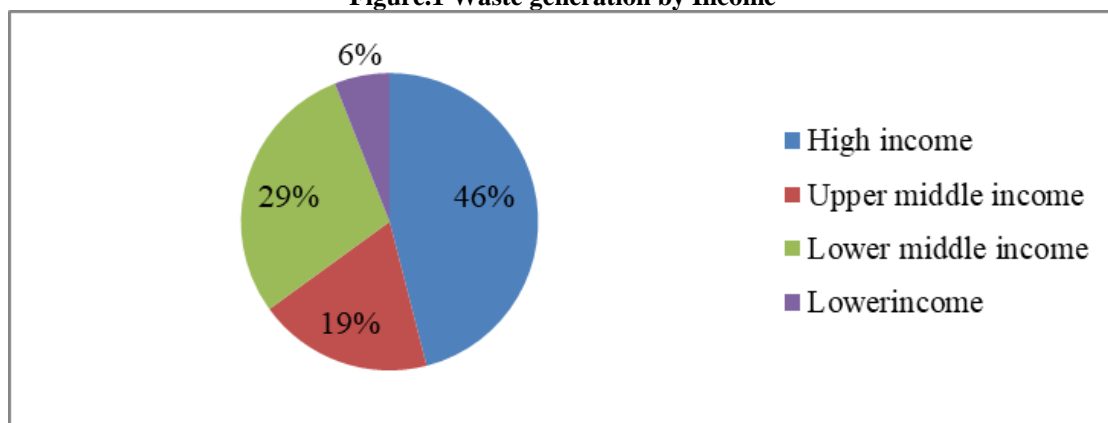
Chart 1: Municipal solid waste OECD



Waste Generation by country income level:

High income countries produce the most waste per capita, while low income countries produce the least solid waste per capita. Although the total waste generation for lower middle income countries is higher than that of upper middle income countries, likely skewed as a result of China’s inclusion in the lower middle income group, the average per capita waste generation amounts for the various income groups reflect the income level of the countries (figure 2). The high, upper-middle, and low income designations are somewhat inaccurate as these classifications are country-wide, and in several countries average national affluence can be very different from average affluence of the urban populations. Only the affluence of urban residents is important in projecting MSW rates.

Figure.1 Waste generation by Income



Source: Global review of SWM

Figure 2.1 depicts global waste generation by country per income level, showing decreasing average rates of per capita waste according to income level. It shows the higher income group produces more waste that is 46 percent. Secondly lower middle income group produce 29 percent of waste. Lower income group produce only 6 percent.

Table 2 Waste generation by income level

| Income level | Waste generation per capita (kg/capita/day) | | |
|--------------|---|----------------|---------|
| | Lower boundary | Upper boundary | Average |
| High | 0.70 | 14 | 2.1 |
| Upper Middle | 0.11 | 5.5 | 1.2 |
| Lower Middle | 0.16 | 5.3 | 0.79 |
| Lower | 0.09 | 4.3 | 0.60 |

Table: 2 shows that current waste generation per capita by income level, indicating the lower boundary and upper boundary for each region, as well as average kg per capita per day of waste generated within each group according country income level.

Status of solid waste management in India:

With rapid urbanization and globalization coupled with large population in India, there has been rapid change in consumer patterns in India leading massive quantities of generation of Municipal Solid Waste (MSW) along with its unscientific handling leading to degradation of environment causing health hazards. An efficient MSW management system refers to a combination and interrelationship of elements like waste generation, collection, storage, transportation and disposal. Like any other developing country, India also follows the basic footsteps in expressing the MSW management as “not in my backyard” syndrome and leaves it entirely to be taken care by municipal authorities.

According to the constitution act, 1992 (74th amendment) in India, municipal authorities are responsible for the management of solid waste within their respective boundaries. The management of MSW in India has risen to be a severe problem not only because of the environmental and aesthetic concern but also because of the enormous amount being generated every day. As the Central Pollution Control Board of India (CPCB) the total amount of MSW generated is 1, 27,486 TPD of which 89,334 TPD (70 percent) is collected and 15,881 TPD (13 percent) is processed or treated. However, MSW management in India remains the most

neglected areas due to financial and infra-structural constraints, lack of awareness and weak implementation of laws.

Over the past few decades, India has witnessed high population growth particularly in urban areas, mainly due to the migration of people which leads not only to the generation of high amount of solid waste as well as put tremendous pressure on resources. As per Census of India, 2011; the population of urban India is 377 million, which accounts for 31percent of the total population. Presently, urban population in India generates about 1, 43,449 Metric Tons per day (MTPD) of MSW .For an effective waste Management system utilization of data including quantity, quality and composition (both physical and chemical) of waste (from different socio-economic groups) plays a very vital role. As such, these parameters depend on number of varied factors like living standards, seasonal variations, food habits, source of generation and socio-economic conditions of the area.

Table 3 - Waste generation (year wise)

| Items | 1947 | 1971 | 1991 | 2001 | 2011 | 2021 |
|--|-------|------|-------|------|------|------|
| Urban population(million) | 56.9 | 109 | 21.7 | 285 | 377 | 689 |
| Daily per capita waste generated(kg/day) | 0.295 | 0.3 | 0.37 | 0.44 | 0.50 | 0.61 |
| Total waste generated(million tons/year) | 6.0 | 14.9 | 23.86 | 39 | 49 | 58.2 |

Source: Population & waste statistics in India 2011

Table: 3 shows that in 2011 India generated 49 million tons per year. When we compare it with 1947, It is noted that there is a large increase in the amount of waste. This table clearly shows that when the population increases the amount of waste generation also increases.

Table 4 State – Wise MSW Generation

| Sl.No | Name of the state | Municipal solid waste MT/Day(2016/2021) |
|-------|-------------------|---|
| 1 | Andaman & Nicobar | 50 |
| 2 | Madhya Pradesh | 4500 |
| 3 | Uttaranchal | 752 |
| 4 | Assam | 1146.28 |
| 5 | Bihar | 1670 |
| 6 | Orissa | 2239.2 |
| 7 | Chhattisgarh | 1167 |
| 8 | Mizoram | 4742 |
| 9 | Delhi | 7384 |
| 10 | Goa | 193 |
| 11 | Gujarat | 7378.775 |
| 12 | Haryana | 536.85 |
| 13 | Himachal Pradesh | 304.3 |
| 14 | Jammu Kashmir | 1792 |
| 15 | Jharkhand | 1710 |
| 16 | Karnataka | 6500 |
| 17 | Uttar Pradesh | 8338 |
| 18 | Maharashtra | 19204 |
| 19 | Manipur | 112.9 |
| 20 | Meghalaya | 284.6 |
| 21 | Daman Diu & Dadra | 41 |
| 22 | Andhra Pradesh | 11500 |
| 23 | Nagaland | 187.6 |
| 24 | Chandigarh | 380 |
| 25 | Pondicherry | 380 |
| 26 | Punjab | 2793.5 |
| 27 | Rajasthan | 5037.3 |

| | | |
|----|-------------------|--------|
| 28 | Sikkim | 40 |
| 29 | Tamil Nadu | 12504 |
| 30 | Tripura | 360 |
| 31 | Uttar Pradesh | 11,585 |
| 32 | Arunachal Pradesh | 93,802 |
| 33 | West Bengal | 12557 |

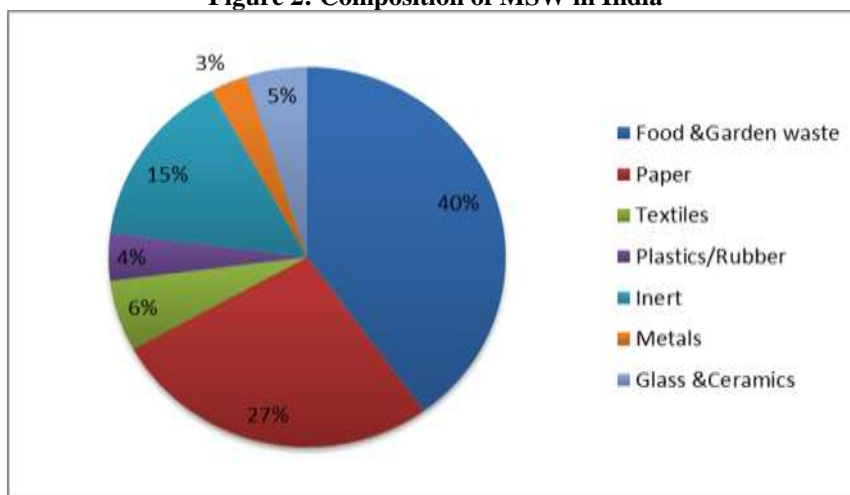
Source: Msw generation in India 2015-2020

Table: 4 shows the state – wise MSW generation in India. From this table we can see that Uttar Pradesh only generates 11,585 million tons per day which is lower by compared with other states. Maharashtra generates 19204 which are higher compared with other states.

Generation of waste:

Generation of MSW has a strong correlation with the population of the area or a city. India is growing and so are the mountains of waste its cities and villages are producing. The generation of MSW begins with the daily routine activities of the day. The quantities of MSW generated are highly influenced by economic development, geographic locations, variations in seasons, lifestyle and standard of living and population. So it becomes essential to acquire data on quantity variation and generation for implementing effective MSW management practices and efficient recovery of resources. For an effective waste management strategy it is necessary to identify the nature and composition of the waste. The following figure shows the typical average physical composition of MSW in India.

Figure 2: Composition of MSW in India



This figure shows that food& garden waste composition is 40percent and metal is only 3 percent. The second highest is paper composition that is 27 percent. In developing country like India, reports states that the organic fraction of MSW varies between 35 to 60percent in different parts of country. The organic fraction includes paper, plastics, yard waste, food waste, wood, textiles and disposable diapers. The organic matter in MSW in developing countries like India is much higher than that in the waste in developed countries.

Solid waste management in Uttar Pradesh

Solid waste management in Uttar Pradesh, like in many other states in India, is a significant challenge due to the high population density and rapid urbanization. The state government of Uttar Pradesh has implemented various initiatives and policies to address this issue.

1. Waste Collection: The state government has focused on improving waste collection services in urban and rural areas. Municipal corporations, municipalities, and local bodies are responsible for collecting waste from households, commercial establishments, and public spaces.
2. Segregation of Waste: The segregation of waste at the source is an essential component of solid waste management. The government has encouraged the practice of separating waste into categories like organic, inorganic, recyclable, and hazardous waste. This segregation helps facilitate proper treatment and disposal of different types of waste.

3. **Waste Treatment and Disposal:** Uttar Pradesh has established waste treatment and disposal facilities such as composting plants, waste-to-energy plants, and sanitary landfills. These facilities help process and dispose of waste in an environmentally sustainable manner, reducing the burden on landfills and minimizing the release of harmful pollutants.
4. **Awareness and Education:** The government has launched awareness campaigns and educational programs to educate citizens about the importance of proper waste management. These initiatives aim to encourage public participation in waste segregation, reduce littering, and promote responsible waste disposal practices.
5. **Swachh Bharat Mission:** The central government's flagship program, Swachh Bharat Mission (Clean India Mission), has been instrumental in promoting cleanliness and sanitation across the country, including Uttar Pradesh. The mission focuses on constructing household toilets, promoting community sanitation, and creating public awareness about sanitation and waste management.
6. **Plastic Ban:** The Uttar Pradesh government has implemented a ban on single-use plastic bags and other non-biodegradable plastic products. This measure aims to reduce plastic waste generation and promote the use of eco-friendly alternatives.
7. **Public-Private Partnerships:** The government has encouraged public-private partnerships to improve solid waste management infrastructure and services. This approach involves engaging private entities in waste collection, transportation, and processing, thus leveraging their expertise and resources.

Various initiatives for Solid waste management in Uttar Pradesh

The government of Uttar Pradesh has implemented several initiatives to address solid waste management challenges in the state. Here are some notable initiatives:

1. **Swachh Bharat Mission-Urban (SBM-U):** The Swachh Bharat Mission-Urban is a flagship program by the central government aimed at achieving universal sanitation and cleanliness. Under this mission, the state government of Uttar Pradesh has focused on improving solid waste management infrastructure, waste collection, and disposal systems in urban areas.
2. **Construction of Waste Treatment Plants:** The government has undertaken the construction of waste treatment plants across the state. These plants include composting facilities, waste-to-energy plants, and biomethanation plants. They help in treating organic waste, producing compost and energy, and reducing the burden on landfills.
3. **Integrated Solid Waste Management Projects:** The government has initiated Integrated Solid Waste Management (ISWM) projects in various cities and towns. These projects aim to develop a comprehensive waste management system, including waste collection, segregation, treatment, and disposal. They also focus on promoting public participation and awareness.
4. **Door-to-Door Waste Collection:** The government has promoted door-to-door waste collection services to ensure regular and efficient waste collection from households. This approach helps in reducing littering and encourages residents to segregate waste at the source.
5. **Waste Segregation at Source:** The government has emphasized waste segregation at the source, encouraging citizens to separate waste into different categories like organic, inorganic, recyclable, and hazardous waste. This enables better management and treatment of different types of waste.
6. **Plastic Waste Management:** To tackle the issue of plastic waste, the government has implemented measures such as the ban on single-use plastic bags and the promotion of alternatives like cloth bags and paper bags. Additionally, awareness campaigns have been conducted to educate citizens about the harmful effects of plastic waste.
7. **Public Awareness Campaigns:** The government has launched extensive public awareness campaigns to educate citizens about proper waste management practices, waste segregation, and responsible waste disposal. These campaigns aim to promote behavioral change and encourage active participation from residents.
8. **Public-Private Partnerships (PPPs):** The government has encouraged public-private partnerships to enhance solid waste management infrastructure and services. Private sector participation is sought in waste collection, transportation, processing, and landfill management.
9. **Capacity Building and Training:** The government has focused on capacity building and training programs for municipal staff and waste management workers. These initiatives aim to enhance their skills in waste management techniques, operation and maintenance of waste treatment plants, and effective implementation of solid waste management practices.

These initiatives demonstrate the commitment of the government of Uttar Pradesh to improving solid waste management practices and infrastructure in the state. Continued efforts, effective implementation, and sustained public participation are crucial to achieving sustainable waste management in Uttar Pradesh.

Challenges faced for Solid waste management in Uttar Pradesh

Despite various initiatives, Uttar Pradesh faces several challenges in solid waste management, including:

1. **Population Density:** Uttar Pradesh is one of the most populous states in India, which leads to a high volume of waste generation. The large population puts immense pressure on waste management infrastructure and services.
2. **Inadequate Infrastructure:** Many cities and towns in Uttar Pradesh lack proper waste management infrastructure, such as waste treatment plants, recycling facilities, and landfill sites. The existing infrastructure is often inadequate to handle the increasing amount of waste generated.
3. **Waste Collection and Transportation:** Ensuring efficient and regular waste collection from households, commercial establishments, and public spaces can be a challenge. Inadequate waste collection and transportation systems can lead to improper disposal and littering.
4. **Lack of Waste Segregation:** The practice of waste segregation at the source is crucial for effective waste management. However, there is often a lack of awareness and participation among the public in segregating waste into different categories. This makes it challenging to implement proper treatment and disposal methods for different types of waste.
5. **Informal Waste Sector:** The presence of informal waste pickers and recyclers is common in Uttar Pradesh. While they play a vital role in waste management, their working conditions, lack of formal recognition, and limited access to resources pose challenges in integrating them into the formal waste management system.
6. **Limited Public Awareness:** There is a need for increased public awareness and education regarding proper waste management practices. Many residents may not be aware of the importance of waste segregation, responsible disposal, and the potential environmental and health impacts of improper waste management.
7. **Enforcement and Monitoring:** Ensuring compliance with waste management regulations and effective monitoring of waste management practices can be challenging. Lack of enforcement and monitoring mechanisms can lead to non-compliance, illegal dumping, and inefficient waste management practices.
8. **Financial Constraints:** Adequate funding is required for the development and maintenance of waste management infrastructure, implementation of awareness programs, and capacity building. Limited financial resources can hinder the improvement of solid waste management systems.

Addressing these challenges requires a multi-pronged approach, including the development of infrastructure, public awareness campaigns, stakeholder engagement, policy implementation, and effective enforcement. Collaboration between the government, local authorities, private sector, and the public is essential to overcome these challenges and ensure effective solid waste management in Uttar Pradesh..

Status of waste management system in Uttar Pradesh

Uttar Pradesh, being one of the most populous states in India, faces significant challenges in waste management. The state government has been implementing various initiatives to improve waste management practices and infrastructure. However, it is important to note that the effectiveness and progress of these initiatives may vary across different regions and cities within Uttar Pradesh.

It's important to note that waste management is a dynamic field, and the status of the system can change over time. The government of Uttar Pradesh, along with local authorities, continues to work towards improving waste management infrastructure, strengthening enforcement, enhancing public awareness, and implementing sustainable waste management practices.

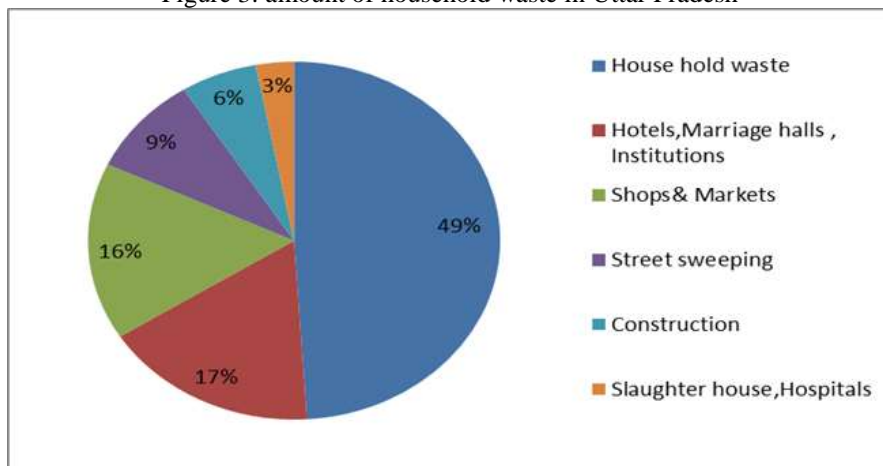
1. **Waste Collection:** Waste collection in Uttar Pradesh has seen improvements over the years, especially in urban areas. Municipal corporations, municipalities, and local bodies are responsible for waste collection from households, commercial establishments, and public spaces. However, challenges remain, particularly in rural areas, where waste collection services may be limited or inadequate.
2. **Segregation of Waste:** The segregation of waste at the source is an important aspect of waste management. The government has promoted the practice of waste segregation into categories like organic, inorganic, recyclable, and hazardous waste. Efforts have been made to raise awareness among the public about the importance of waste segregation, but there is still progress to be made in terms of widespread implementation.
3. **Waste Treatment and Disposal:** Uttar Pradesh has a mix of waste treatment and disposal facilities, including composting plants, waste-to-energy plants, and sanitary landfills. However, the availability and effectiveness of these facilities can vary across different regions of the state. In some areas, there may be a reliance on open dumping, which can lead to environmental and health hazards.
4. **Awareness and Education:** The government has launched various awareness campaigns and educational programs to promote proper waste management practices. These initiatives aim to engage and educate citizens about waste segregation, responsible disposal, and the environmental impact of improper waste

management. However, enhancing public awareness and participation in waste management practices is an ongoing challenge.

5. Plastic Ban: The Uttar Pradesh government has implemented a ban on single-use plastic bags and other non-biodegradable plastic products. The ban is aimed at reducing plastic waste generation and promoting the use of eco-friendly alternatives. However, the enforcement and compliance with the ban can be a challenge, and the effectiveness of the ban may vary across different regions.
6. Swachh Bharat Mission: The central government's Swachh Bharat Mission has had a significant impact on improving sanitation and waste management practices across India, including Uttar Pradesh. The mission has focused on constructing household toilets, promoting community sanitation, and creating public awareness about sanitation and waste management. It has played a crucial role in driving initiatives and funding for waste management projects.

Resorting to dumping the waste generated is also a serious matter since such insanitary methods of disposal of solid waste would cause a serious health concerns. Part of the waste generated remains unattended and grows in the heaps at poorly maintained collection centers.

Figure 3: amount of household waste in Uttar Pradesh

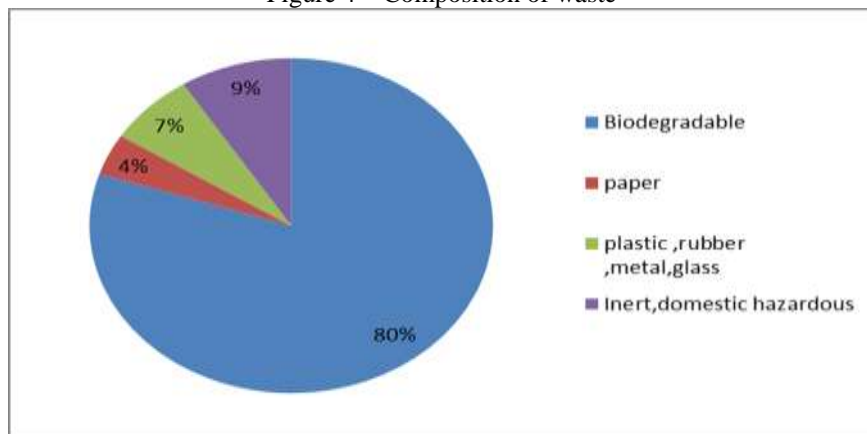


Source: MSW statistics in Uttar Pradesh

The choice of a disposal site also is more a matter of what is available than what is suitable. In several places locals are up in arm against prevalent of dumping and landfill. Contractors who transport garbage to dump in the interior village dumping sites or near forests or water bodies often face serve resistance from locals and environment activists.

Figure: 3 shows that there is large amount of household waste which is 49 percent and the less amount of waste comes from slaughter house and hospitals. Secondly, waste is produced by hotels, marriage halls and institutions which is 17 percent.

Figure 4 Composition of waste



Source : MSW statistics in Uttar Pradesh

Figure: 4 shows that there is 80percentof biodegradable waste and paper is only 4 percent .There is only 9 percent of plastic, rubber, metal and glass and 7 percent is inert, domestic hazardous.Integrated Solid Waste Management (ISWM) takes an overall approach to creating sustainable systems that are economically affordable, socially acceptable and environmentally effective. An integrated solid waste management system involves the use of a range of different treatment methods, and key to the functioning of such a system is the collection and sorting of the waste. It is important to note that no one single treatment method can manage all the waste materials in an environmentally effective way.

III. Conclusion:

Waste management can be defined as the “collection, removal, processing and disposal of materials considered waste”. Waste can be put into landfills, incinerated, recycled, or composted. The most sustainable way to manage waste is to recycle and compost. Solid waste management is a continually growing problem at global, regional, and local levels. Economic development, globalization and improving living standard in cities have lead to increase in the quantity and complexity of generated waste. Solid waste management is one of the crucial areas indicating the status of urban infrastructure and environment quality. It assumes particular significance in the view of the challenge posed by rapid urbanization and industrialization and also from the point of view of natural resource management; protection of open places and hygiene conditions in general management of waste resulting out of the rapid urbanization had become a serious concern for the government department and local bodies, pollution control agencies, regulatory bodies, and also the public rapid growth of population and industrialization degrade urban environment and place serious stress on natural resources, which undermine equitable and sustainable development.

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